UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,791	05/07/2007	Mitsuru Suzuki	065933-0294	2617

20277 7590 08/25/2010

MCDERMOTT WILL & EMERY LLP
600 13TH STREET, N.W.
WASHINGTON, DC 20005-3096

EXAMINER	
KIM, HEE-YONG	
ART UNIT	PAPER NUMBER
2621	
MAIL DATE	DELIVERY MODE
08/25/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/588,791	SUZUKI ET AL.	
	Examiner	Art Unit	
	HEE-YONG KIM	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 June 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This office action is in reply to Applicant's Response dated June 16, 2010.

2. **Claims 2-4** have been amended.

3. **Claims 2-6** are still pending.

Response to Arguments

4. 35 U.S.C. 112 Rejection over **claim 4** is withdrawn since amendment overcomes the rejection.

5. Applicant's arguments with respect to **claims 2-6** have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claims 2-3, 5-6** are rejected as being unpatentable over Watkins (US 6,507,672), hereafter referenced as Watkins.

Regarding **claim 2**, in the same field of endeavor, Watkins discloses Video Encoder for Digital Video Displays. Watkins specifically discloses An image coding apparatus comprising: a coding circuit (Fig.4 Multimedia Encoder) which codes

(encode, col.1, line 32) an image signal (a frame, col.1, line 32) to be coded, by using intra-frame coding scheme (Intra frame, col.2, line 27-43) and/or inter-frame coding scheme (Predicted Frame and Bi-directional frame, col.2, line 27-43).
However Watkins fails to disclose a reference mode selection circuit which sets selectively either a reference mode that uses a bidirectional coding in which a past frame and a future frame are referred to or a reference mode that does not use the bidirectional coding, as the inter-frame coding scheme, according to an coding execution environment in said apparatus, wherein said reference mode selection circuit sets the reference mode that uses the bidirectional coding when an image represented by the image signal to be coded has a first resolution, and sets the reference mode that does not use the bidirectional coding when the image represented by the image signal to be coded has a second resolution which is higher than the first resolution.

However, Watkins further discloses that P frames receives a fairly high amount of compression, but Bi-directional pictures has the greatest amount of compression and requires both a past and a future references (col.2, line 27-43). Also it was well known in the art that video compression uses motion compensation of current frame using reference frames and motion estimation is the biggest burden of computation. So in the case of Bi-directional frame, the cost of motion estimation is two times bigger than P frame, because bi-directional frame uses two frame (past and future frames) compared to P frame using only one reference frame. Depending on the processor capability, the motion estimation of B-frame cannot be done in real time for High resolution pictures which requires more computation than low resolution picture, even though it is possible

in the low resolution pictures. In this case, it was obvious to the ordinary person in the art that the reference mode is selected such that the bidirectional coding is not used for high resolution and bidirectional coding is used for low resolution, in order to encode the images in real time.

Therefore, given this teaching, it would have been obvious to one skilled in the art to modify Watkins to provide a reference mode selection circuit which sets selectively either a reference mode that uses a bidirectional coding in which a past frame and a future frame are referred to or a reference mode that does not use the bidirectional coding, as the inter-frame coding scheme, according to an coding execution environment in said apparatus,

wherein said reference mode selection circuit sets the reference mode that uses the bidirectional coding when an image represented by the image signal to be coded has a first resolution, and sets the reference mode that does not use the bidirectional coding when the image represented by the image signal to be coded has a second resolution which is higher than the first resolution, in order to encode the images in real time.

The Watkins Multimedia Encoder, incorporating selection of reference mode such that it uses B-frame for low resolution but does not use for the high resolution, has all the features of claim 2.

1.

Regarding **claim 3**, Watkins discloses Video Encoder for Digital Video Displays. Watkins specifically discloses An image coding apparatus comprising:

a coding circuit (Fig.4 Multimedia Encoder) which codes (encode, col.1, line 32) an

image signal (a frame, col.1, line 32) to be coded, by using intra-frame coding scheme (Intra frame, col.2, line 27-43) and/or inter-frame coding scheme (Predicted Frame and Bi-directional frame, col.2, line 27-43).

However, Watkins fails to disclose a reference mode selection circuit which sets selectively either a reference mode that uses a bidirectional coding in which a past frame and a future frame are referred to or a reference mode that does not use the bidirectional coding, as the inter-frame coding scheme, according to an coding execution environment in said apparatus,

wherein said reference mode selection circuit sets the reference mode that uses the bidirectional coding when the image signal to be coded has a first frame rate, and sets the reference mode that does not use the bidirectional coding when the image signal to be coded has a second frame rate which is lower than the first frame rate.

However, it was well know in the art that higher frame rate means more pictures and requires more bit rate for the compression, and Bi-directional coding is more efficient compression than P-frame coding only. Therefore, it was obvious to the ordinary person in the art that reference mode including B-frame coding is used for high frame rate images and P-frame only is used for low resolution picture, in order to compress video efficiently for higher frame rate to meet the bit rate constraint.

Therefore, given this teaching, it would have been obvious to one skilled in the art to modify Watkins to provide a reference mode selection circuit which sets selectively either a reference mode that uses a bidirectional coding in which a past frame and a future frame are referred to or a reference mode that does not use the

bidirectional coding, as the inter-frame coding scheme, according to an coding execution environment in said apparatus,

wherein said reference mode selection circuit sets the reference mode that uses the bidirectional coding when the image signal to be coded has a first frame rate, and sets the reference mode that does not use the bidirectional coding when the image signal to be coded has a second frame rate which is lower than the first frame rate, in order to compress video efficiently for higher frame rate to meet the bit rate constraint. The Watkins Multimedia Encoder, incorporating selection of reference mode such that it uses B-frame for high frame rate but does not use for low frame rate, has all the features of claim 3.

Regarding **claim 4**, Watkins discloses Video Encoder for Digital Video Displays. Watkins specifically discloses An image coding apparatus comprising:

a coding circuit (Fig.4 Multimedia Encoder) which codes (encode, col.1, line 32) an image signal (a frame, col.1, line 32) to be coded, by using intra-frame coding scheme (Intra frame, col.2, line 27-43) and/or inter-frame coding scheme (Predicted Frame and Bi-directional frame, col.2, line 27-43).

However, Watkins fails to disclose a reference mode selection circuit which sets selectively either a reference mode that uses a bidirectional coding in which a past frame and a future frame are referred to or a reference mode that does not use the bidirectional coding, as the inter-frame coding scheme, according to an coding execution environment in said apparatus,

wherein said reference mode selection circuit sets the reference mode that uses the bidirectional coding when a bit rate of transferring the image signal to be coded has a first rate, and sets the reference mode that does not use the bidirectional coding when the bit rate of transferring the image signal to be coded has a second rate which is higher than the first rate.

However, it was well know in the art that Bi-directional coding is more efficient compression than P-frame coding only. Depending on the target bit rate, there is need for Bi-directional coding. For lower target bit rate, P-frame coding only (Not using Bi-directional coding may fail to meet the bit rate because of less efficient compression. Therefore, it was obvious to the ordinary person in the art that the reference mode using Bi-directional coding is used for low target bit rate and the reference mode not using Bi-directional mode is used for high target bit rate, in order to meet the target bit rate.

Therefore, given this teaching, it would have been obvious to one skilled in the art to modify Watkins to provide a reference mode selection circuit which sets selectively either a reference mode that uses a bidirectional coding in which a past frame and a future frame are referred to or a reference mode that does not use the bidirectional coding, as the inter-frame coding scheme, according to an coding execution environment in said apparatus,

wherein said reference mode selection circuit sets the reference mode that uses the bidirectional coding when the image signal to be coded has a first frame rate, and sets the reference mode that does not use the bidirectional coding when the image signal to be coded has a second frame rate which is lower than the first frame rate, in order to

compress video efficiently for higher frame rate to meet the bit rate constraint. The Watkins Multimedia Encoder, incorporating selection of reference mode such that it uses B-frame for low bit rate but does not use for high bit rate, has all the features of claim 4.

Regarding **claim 5**, Watkins discloses everything claimed as applied above (see claim 2). Watkins further discloses wherein as the coding scheme said coding circuit (Fig.4 Multimedia Encoder) codes (encode, col.1, line 32) the image signal (a frame, col.1, line 32) by using a scheme complying with MPEG (MPEG, col.2, line 10-19) in the reference mode that uses a bidirectional coding (Encoder including I, P, B frame coding), the coding is performed using I pictures (Intra frame, col.2, line 27-43), P pictures and B pictures (Predicted Frame and Bi-directional frame, col.2, line 27-43), and in the reference mode that does not use (inherent in Watkins because Watkins has a choice of encoding without B frame) the bidirectional coding, I pictures and P pictures are used.

Regarding **claim 6**, Watkins discloses everything claimed as applied above (see claim 2). Watkins further discloses An image pickup apparatus (Video Buffer 414 and RISC CPU 410, Fig.4), comprising:

an image input unit (Video Buffer 414, Fig.4) which takes an image of an object and acquires an image signal (Digital Video, Fig.4);

an image coding apparatus (Fig.4 Multimedia Encoder) according to Claim 2, which codes the image signal (encode a frame, col.1, line 32); and a data storage unit

(Bitstream Buffer 416, Fig.4) which stores coded data (bitstream) generated by the coding.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to HEE-YONG KIM whose telephone number is (571)270-3669. The examiner can normally be reached on Monday-Thursday, 8:00am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on 571-272-7905. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

.

/HEE-YONG KIM/
Examiner, Art Unit 2621

/Andy S. Rao/
Primary Examiner, Art Unit 2621
August 12, 2010